

Claims

1. A window regulator assembly comprising:
 - at least one rail (112A, 112B);
 - a lift plate (116A, 116B) slidingly mounted on each rail;
 - at least one cable (132A, 132B);
 - a first guide pulley (140A) mounted near a first end of said at least one rail;
 - a second guide pulley (140B) mounted near a second end of said at least one rail; and
 - drive means for translating the at least one cable;characterized by a lift pulley (136A, 136B) mounted to each lift plate, and in that said least one cable has a first end anchored (134A) near said first rail end and wound about the lift pulley of the rail presenting said first end (136A) and thence routed about the first guide pulley (140A), and a second end anchored (134B) near said second rail end and wound about the lift pulley of the rail presenting said second end (136B) and thence routed about the second guide pulley (140B), said at least one cable interconnecting the first and second guide pulleys,
 - whereby actuation of the drive means in a first sense tensions said at least one cable to move each lift plate towards said first rail end, and
 - actuation of the drive means in a second sense, opposite said first sense, tensions said at least one cable to move each lift plate towards said second rail end.
2. A window regulator assembly comprising:
 - a rail (12),
 - a lift plate (16) mounted to slide along the rail;
 - at least one cable;
 - first and second guide pulleys (40a, 40b) respectively mounted near first and second ends of the rail; and
 - a rotatable cable guiding drum(44);

characterized by a lift pulley (36) mounted to the lift plate; and in that the at least one cable has

a first end (34a) anchored near the first end of the rail and wound about the lift pulley (36) and thence routed about the first guide pulley (40a) to operatively engage the drum (44), and

a second end (34b) anchored near the second end of the rail and wound about the lift pulley (36) and thence routed about the second guide pulley (40b) to operatively engage the drum (44),

whereby operative movement of the drum in a first sense tensions the at least one cable to move the lift plate towards the first end of the rail, and operative movement of the drum in a second sense, opposite said first sense, tensions the at least one cable to move the lift plate towards the second end of the rail.

3. A window regulator assembly according to claim 2, wherein said at least one cable comprises a first cable having said first cable end and a second cable having said second cable end, the other ends of said first and second cables being attached to said drum.

4. A window regulator assembly according to claim 2, wherein said lift pulley is rotatably mounted to said lift plate.

5. A window regulator assembly according to claim 2, wherein said first and second guide pulleys are each rotatably mounted on said rail.

6. A window regulator assembly according to claim 2, wherein said lift pulley has at least two independent guides, each for guiding a cable along a generally U-shaped route.

7. A window regulator assembly according to claim 2, wherein said lift plate includes a rail guide sliding along said rail.

8. A window regulator assembly according to claim 2, including means for maintaining tension on said at least one cable.
9. A window regulator assembly according to claim 2, wherein said drum is drivingly rotated by a crank or a motor.
10. A window regulator assembly according to claim 2, including additional guide pulleys, wherein said at least one cable is routed through the additional guide pulleys between said first and second guide pulleys and said drum.
11. A window regulator assembly comprising:
 - first and second rails (112A, 112B);
 - first and second lift plates (116A, 116B) respectively slidingly mounted to the first and second rails;
 - at least one cable (132A, 132B);
 - first and second guide pulleys (140A, 140B) respectively mounted near first and second ends of the first and second rails;
 - a drum (144);
 - characterized by first and second lift pulleys (136A, 136B) respectively mounted to the first and second lift plates; and wherein said least one cable has a first end anchored (134A) near said first rail end and wound about the first lift pulley (136A) of the first rail (112A) and thence routed about the first guide pulley (140A) to operatively engage the drum (144), and a second end anchored (134B) near said second rail end and wound about the second lift pulley (136B) of the second rail (112B) and thence routed about the second guide pulley (140B) to operatively engage the drum (144);
 - and by additional means (132C) for interconnecting the first and second lift plates,
 - whereby operative movement of the drum in a first sense tensions said at least one cable to move the first and second lift plates towards said first rail end, and operative movement of the drum in a second sense, opposite said

first sense, tensions said at least one cable to move each lift plate towards said second rail end.

12. A window regulator assembly according to claim 11, wherein said interconnecting means is a cable routed around third and fourth guide pulleys respectively mounted to the first and second rails.

13. A window regulator assembly according to claim 11, wherein said at least one cable comprises a first cable presenting said first cable end and a second cable presenting said second cable end, the other ends of said first and second cable ends being attached to said drum.

14. A window regulator assembly according to claim 11, wherein said lift pulleys are rotatably mounted to said lift plates.

15. A window regulator assembly according to claim 11, wherein said first and second guide pulleys are rotatably mounted to said first and second rails.

16. A window regulator assembly comprising:
a rail (312),
a lift plate (316) mounted to slide along the rail;
at least one cable; and
first and second guide pulleys (340a, 340b) respectively mounted near first and second ends of the rail;
characterized by a lift pulley (336) mounted to the lift plate;
the at least one cable having
a first end anchored (334a) near the first end of the rail and wound about the lift pulley (336) and thence routed about the first guide pulley (340a),
a second end (34b) anchored near the second end of the rail and wound about the lift pulley (336) and thence routed about the second guide pulley (340b),

the at least one cable extending linearly between the first and second guide pulleys; and

wherein at least one of the first and second guide pulleys (340a, 340b) is connected to a means for rotating the pulley and includes a multi-turn cable guide for winding and unwinding the at least one cable, whereby rotation of the drive pulley in a first sense tensions the at least one cable to move the lift plate towards the first end of the rail, and operative movement of the drive pulley in a second sense, opposite said first sense, tensions the at least one cable to move the lift plate towards the second end of the rail.